Specification Amendments

Page 5, line 7 through page 6, line 2:

Referring to Fig. 1, a laser fiber 19 comprises a plurality of doped fiber cores, including a central core 20 and a ring of six cores 21 forming an isometric pattern. The cores 20, 21 are surrounded by an inner, pump cladding 22 which is within an outer cladding 23, all of which is surrounded by a protective coating 25. According to the invention, the cores 21 are provided with an index of refraction which is less than the index of refraction of the core 20, as illustrated by the bars 21a and 20a, respectively, in Fig. 2. For example, the ring of Fig. 1 may have a V-value of 1.6 whereas the central core 27 may have a V-value of 2.4. Naturally, the inner, pump cladding 22 has a much lower index of refraction as illustrated by the bar 22a. The difference in the index of refraction of the cores 21 from that of the core 20 need only be on the order of 1% in order to accomplish approximately a two-fold increase in the power (20b in Fig. 3) of the in-phase fundamental supermode, in contrast with the power of the in-phase supermode achievable when the index of refraction is equal in all the cores, as is true in the prior art. Even though the difference in refractive indices between the cores is very slight, the wave guiding effect integrated over a very long fiber length produces a strong focusing of the power toward the central axis of propagation. The total output power comprises a coherent sum of five supermodes, the central beam representing the in-phase supermode containing more than half of the total power, as illustrated in Fig. 3.

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Referring to Fig. 7, a polarized fiber laser 34 includes a single core 35, doped with rare-earth ions, is configured in the shape of a narrow rectangle, with an aspect ratio of at least two between the length and width. The core is

embedded in a large pump cladding 36 which in turn is within an outer cladding 37, all of which is covered by a protective layer 33. In a rectangular core, the allowed characteristic modes are the transverse-electric TE_0 and the transverse-magnetic TM_0 modes. Because the refractive index of the core is greater than that of the clad, the resulting property of the rectangular waveguide formed by the core 35 is that a larger portion of power propagating in the pump cladding 36 is the TM_0 modal power, rather than the TE_0 modal power. Since the loss in the cladding is always much larger than that in the core, the propagation loss for the TM_0 mode is larger than that for the TE_0 mode so that, over a very long fiber length, only the TE_0 mode can survive. Furthermore, a core of an oblong shape (non-circular) will remove the two-fold degeneracy of the HE_{11} mode of a cylindrical fiber waveguide. Therefore, the laser output contains only the linearly polarized TE_0 mode with a polarization oriented along the longer axis of the rectangular core 35. The core 35 need not be rectangular, so long as it is oblong, and may for instance be slightly rounded or highly elliptical.